# SDMS US EPA REGION V -1

SOME IMAGES WITHIN THIS DOCUMENT MAY BE ILLEGIBLE DUE TO BAD SOURCE DOCUMENTS.

141624

# REMOVAL ACTION REPORT
# FOR
# SAUGET AREA 2: SITE Q
# SAUGET, ST. CLAIR COUNTY, ILLINOIS
# TDD: T05-9405-007
# PAN: EIL0837SAA

ecology and environment, inc.
International Specialists in the Environment

# REMOVAL ACTION REPORT
# FOR
# SAUGET AREA 2: SITE Q
# SAUGET, ST. CLAIR COUNTY, ILLINOIS
# TDD: T05-9405-007
# PAN: EIL0837SAA

JULY 29, 1994

Prepared by: Steven J. Hoar Date: 7/29/94

Reviewed by: John Sheehan Date: 7/29/94

Approved by: [signature] Date: 7/29/94

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

## TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF TABLES

LIST OF ATTACHMENTS

## 1.0 INTRODUCTION

The Ecology and Environment, Inc. (E & E) Technical Assistance Team (TAT) was tasked by the United States Environmental Protection Agency (U.S. EPA) under Technical Directive Document (TDD) number T05-9405-007 to conduct a site assessment (SA) for the Sauget Area 2: Site Q, St. Clair County, Illinois. As requested by the U.S. EPA On-Scene Coordinator (OSC), the TAT has prepared this site assessment report to summarize SA activities. The SA was performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and 40 Code of Federal Regulations (CFR), Section 300.415, Paragraph (b) (2) to evaluate on-site conditions and potential threats to human health and the environment.

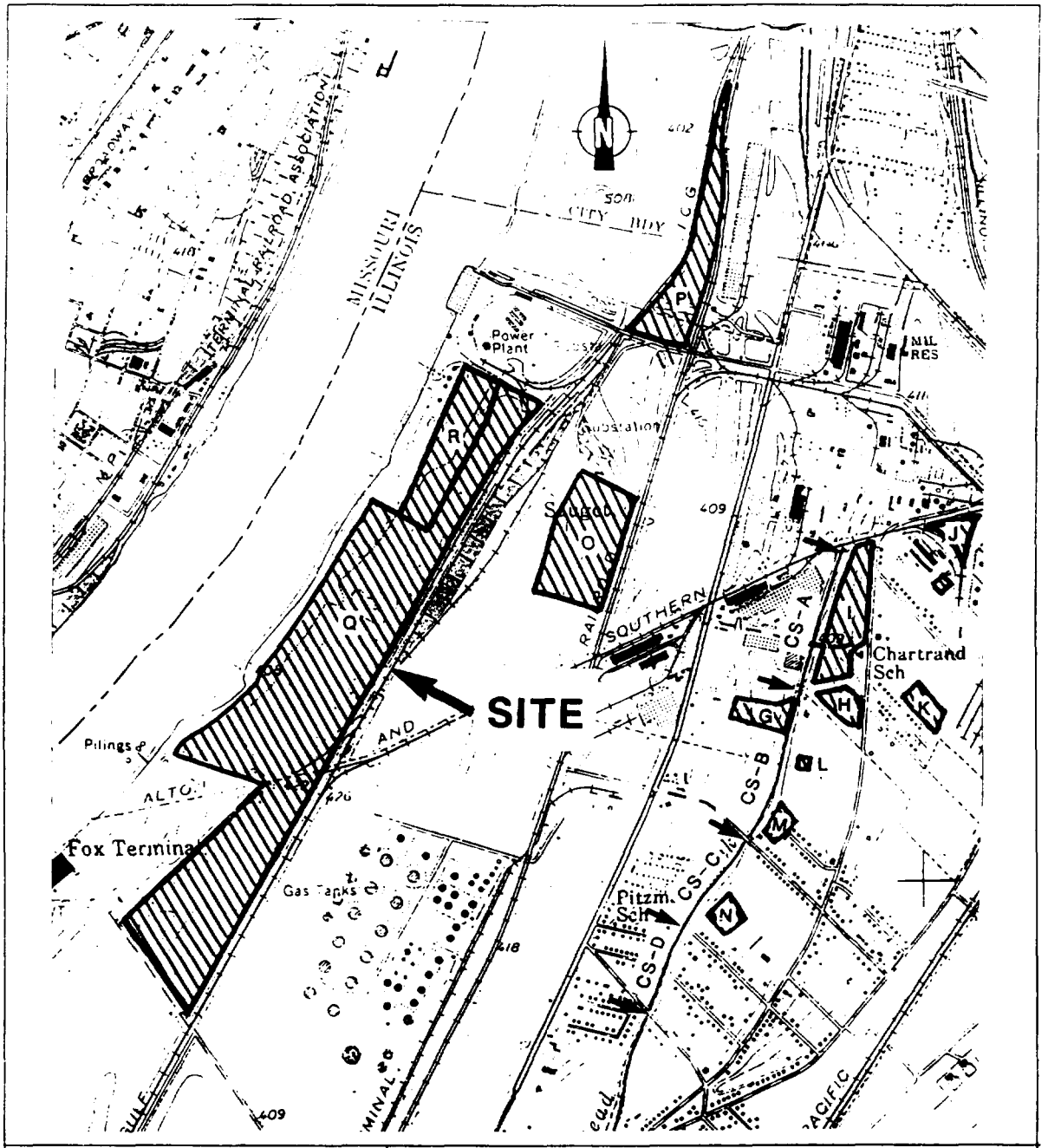
## 2.0 SITE BACKGROUND

### 2.1 Site Description

Site background information was obtained from the site file, including the Illinois Environmental Protection Agency (IEPA) Extended Site Inspection (ESI) Report. The focus of this SA report will be Site Q of Sauget Area 2, which, along with Sauget Area 1, is part of the Dead Creek Project (DCP), or Sauget Sites (SS). The Sauget Sites are located in west-central St. Clair County, Illinois, directly across the Mississippi River from St. Louis, Missouri (see Figure 1 - Site Location Map). The DCP sites consist of a number of former municipal and industrial waste landfills; surface impoundments or lagoons; surface disposal areas; past excavations thought to be filled or partially filled with unknown wastes; and an areal drainage flowpath known as Dead Creek, which is closed off from the surface water intake at Queeny Avenue.

According to site file information, Site Q is a former subsurface/surface disposal area which occupies approximately 90 acres. The site is located in Sauget and Cahokia, and is bordered by DCP Site R and the old Sauget Power Plant on the north; the Illinois Central Gulf Railroad and a United States Corps of Engineers (U.S. COE) river levee on the east; agricultural land on the south; and the Mississippi River on the west (see Figure 2 - Site Features Map). Waste disposal activity occurred between 1962 and 1975.

The primary drinking water source for nearby residences is from a water intake along the Mississippi River, approximately 3 miles north of the DCP sites. At least 50 residents in the area obtain drinking water from private wells, based on Illinois Department of Public Health (IDPH) information. The nearest drinking water well is located on Judith Lane, approximately 1 mile east and upgradient of Site Q. Over 8 industrial wells are located within a 3-mile radius, with at least one downgradient from the site.

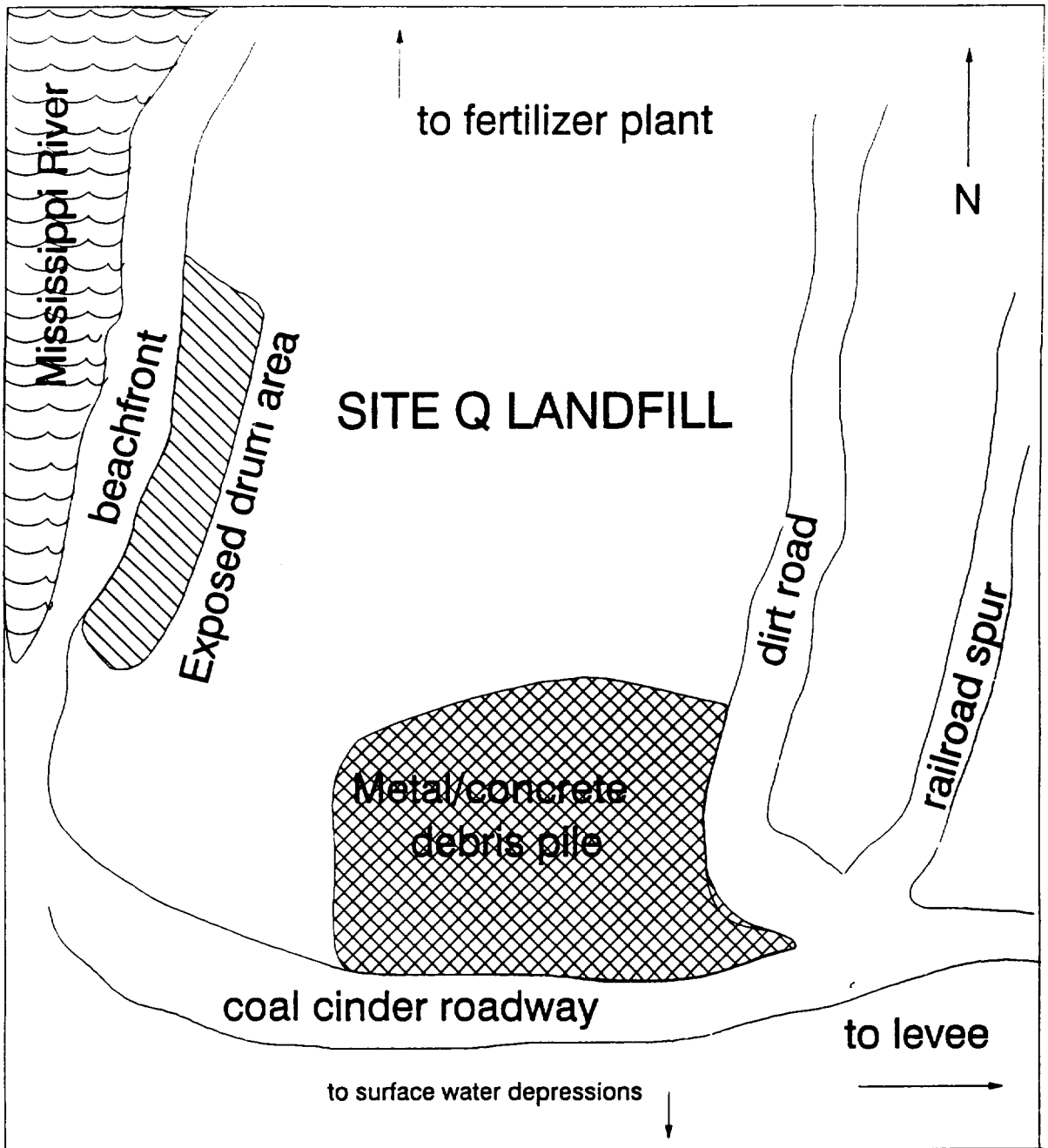




ILLINOIS

**ecology and environment, inc.**
Technical Assistance Team
Region V
111 West Jackson Blvd.
Chicago, IL 60604

| TITLE | | FIGURE # |
|---|---|---|
| SITE LOCATION MAP | | 1 |
| SITE | | SCALE |
| SAUGET AREA 2 - SITE Q | | 1" = 2000' |
| CITY | STATE | PAN |
| SAUGET | ILLINOIS | EIL0837SAA |




SITE

ILLINOIS

ecology and environment, inc.
Technical Assistance Team
Region V
111 West Jackson Blvd.
Chicago, IL 60604

| | |
|---|---|
| TITLE: SITE FEATURES MAP | FIGURE #: 2 |
| SITE: SAUGET AREA 2 - SITE Q | SCALE: NOT TO SCALE |
| CITY: SAUGET STATE: ILLINOIS | PAN: EIL0837SAA |

The land surrounding the site is used primarily for industrial purposes. Commercial activities are located northeast of the site. The nearest residential area is approximately 1.5 miles southeast from the site and also 1 mile west from the site across the Mississippi River.

## 2.2 Site History

As recorded in site file information pertaining to previous site investigations, the surface of Site Q is littered with demolition debris and metal wastes. Two ponds are located at the south portion of the site. Surface runoff in this area flows toward the Mississippi River, but periodic flooding has occurred along the southern portion of the site over the past 10 years, most notably in 1977 and 1987. The most recent flooding episode occurred during the summer of 1993 when the entire site was inundated by Mississippi River flood waters. It was observed that debris was present over much of the site.

A number of investigations have taken place at Site Q. In October of 1984, the IEPA conducted inspections in order to determine the scope of proposed cleanup work at the site. According to records, chemical wastes were disposed at Site Q, but no specific information concerning waste characteristics was available. However, analytical results of samples taken from the subsurface soil samples on-site revealed a variety of organic compounds.

E & E, Inc., under an IEPA contract, conducted an Extensive Site Investigation (ESI) of the DCP sites from 1985 to 1987, and in May of 1988, submitted an ESI Report to IEPA, detailing assessment information from the DCP sites. According to aerial photographs of the area, initial activities were noticed in 1955, with a marked increase in activity in 1962. In 1973, landfill operations appeared to have ceased in the northern portion of the site, but continued in the southern portion. In January of 1975, IEPA inspected the site and indicated disposal activities had ceased. In May of 1980, IEPA received notice that chemical wastes and drums were uncovered during excavation for the railroad spur at the site. Construction workers became nauseous, but specific worker exposure information was not found. In May of 1981, the Illinois Attorney General filed suit against Sauget & Co. for alleged violations against IEPA regulations. In October of 1981, IEPA sampled seeps along the site and results showed high concentrations of organics. In June 1983, as a result of finding buried drums at the northern section of the site, a U.S. EPA Field Investigative Team (FIT) contractor collected 33 subsurface soil samples at the site. A total of 63 of 112 organic compounds from the priority pollutant list were detected, including 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD or dioxin). In March of 1985, the Illinois Attorney General's office reentered a suit against Sauget & Co., ordering a final

cover over the site and requesting a civil penalty. According to site file information, aliphatic hydrocarbons, chloroanilines, chlorobenzenes, chloronitrobenzenes, chlorophenols, dioxins, dibenzofurans, naphthalenes, polychlorinated biphenyls (PCBs), phenanthrene, phenol, and pyrene were identified at Site Q.

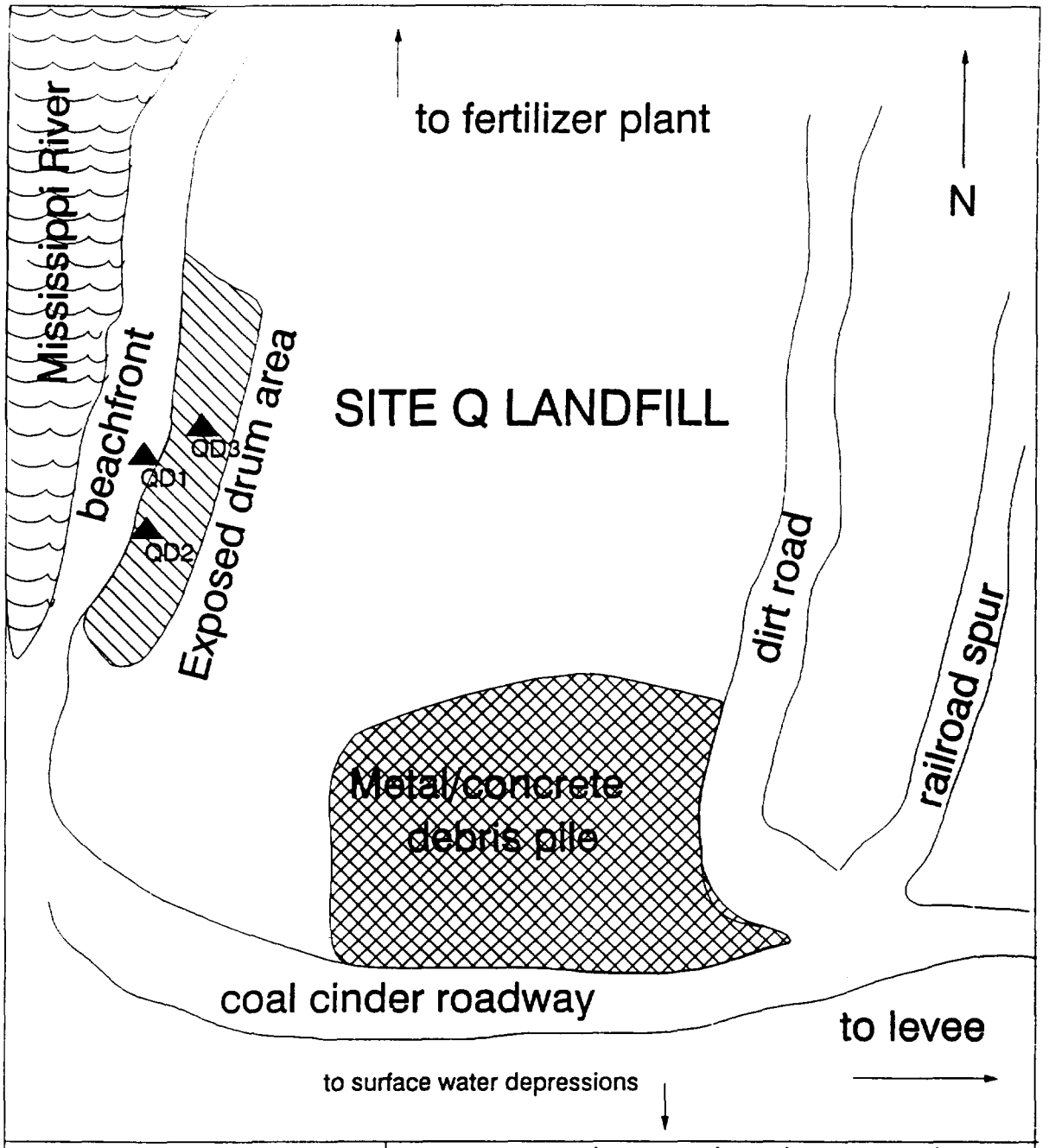
According to IEPA Paul Takacs, as a result of the severity of last year's flooding along the Mississippi River basin, the integrity of Site Q landfill's riverbank had been eroded, exposing numerous previously buried drums. Some of these drums have spilled their contents onto the beachfront. IEPA collected a sample from one drum and the results indicated high levels of PCBs. The U.S EPA and IEPA returned to the Sauget Area 2: Site Q to assess the potential threat to human health and the environment as a result of these drums.

According to IEPA official Paul Takacs, Sauget Area 2: Site Q is owned by Eagle Marine Industries and leases portions of the landfill to various companies.

## 3.0 SITE ASSESSMENT

On May 27, 1994, E & E TAT member Steve Skare met U.S. EPA OSC Samuel Borries and IEPA officials Paul Takacs and Kim Hubbard at the Sauget Area 2: Site Q. After a site safety meeting, the TAT and the OSC conducted an initial reconnaissance of the site with HNU air monitoring. Following the site walk-through, TAT collected 3 samples from exposed drums along the riverbank (see Figure 3 - Sampling Location Map). In the central portion of the site, a metal reclamation operation was separating metal rebar from concrete debris piles, just east of the river levee and railroad spur. A large amount of debris and refuse were found throughout this portion of the landfill, including discarded beverage containers, household goods, furniture, and appliances. At the western edge of the landfill, a 12-foot drop-off led down to the banks of the Mississippi River. In the side of the riverbank and along the top edge of the landfill, approximately 12 corroded 55-gallon drums were found exposed without any markings. Several drums were opened and contained a hard, chocolate-brown colored solid material. No readings above background were recorded on the HNU photoionizer. To the north of the site lies an active chemical fertilizer company and a bulk chemical transfer company.

The TAT, OSC, and IEPA officials investigated the southern portion of the site. Near the railroad spur, a depression was roped off where an underground pipeline had leaked. Another large water-filled surface depression was located approximately 1/2 mile south of pipeline leak. According to IEPA, this pond has numerous drums just under the water surface believed to contain hazardous substances. These drums were not located or sampled. Another large water-filled surface depression was




KEY

▲ Drum Sample

ecology and environment, inc.
Technical Assistance Team
Region V
111 West Jackson Blvd.
Chicago, IL 60604

| | | |
|---|---|---|
| TITLE: SAMPLE LOCATION MAP | | FIGURE #: 3 |
| SITE: SAUGET AREA 2 - SITE Q | | SCALE: NOT TO SCALE |
| CITY: SAUGET | STATE: ILLINOIS | PAN: EIL0837SAA |

located 50 feet west of this depression. The landfill surrounds all these areas, and extends further to the south. No fencing exists around the site. TAT photodocumented site conditions and site photographs appear in Appendix A.

A total of 3 drum samples were collected at the site. Sample QD1 was collected from a drum along the beachfront, just below the landfill boundary. Drum sample QD2 was collected from an unmarked drum along the edge of the landfill. Drum sample QD3 was collected from a protruding drum at the top edge of the landfill. All samples were collected from within the drum's contents using stainless steel trowels prior to placement into 8-ounce glass sample bottles. Samples were sent to Twin City Testing Corporation (Huntingdon), St. Paul, Minnesota for analysis.

## 4.0 ANALYTICAL RESULTS AND DISCUSSION

The drum samples from the May 27, 1994, site visit were analyzed for Toxicity Characteristic Leachate Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) metals, Total and TCLP semivolatile organic compounds, Polychlorinated biphenyls (PCBs) and pesticides.

Results of the chemical analyses performed on TAT collected samples appears in Appendix B. Summaries of selected results are presented in Tables 1 and 2. All data were reviewed and validated by TAT staff to verify data quality.

The solid material contained in the drum samples is considered hazardous because its constituents exceeded the Toxic Substance Control Act (TSCA) limit of 50 ppm for PCBs. PCB Arochlor 1260 was detected in samples QD1 (180,000 ppm), QD2 (260,000 ppm), and QD3 (230,000 ppm).

## 5.0 THREATS TO HUMAN HEALTH AND THE ENVIRONMENT

Paragraph (b)(2) of Part 300.415 of the National Contingency Plan lists factors to be considered when determining the appropriateness of a potential removal action at a site. The following discussion presents a summary of those factors for the Sauget Area 2: Site Q site.

<u>Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains.</u>

Analytical results from the drum samples collected on May 27 1994, indicate the presence of hazardous substances at the Sauget Area 2: Site Q site. The potential exists for trespassers, vandals, or scavengers to come in contact with hazardous substances, especially from deteriorated drums in exposed areas. Plants and animals can come in contact with hazardous substances

TABLE 1
SELECTED SAMPLING RESULTS
FROM MAY 27, 1994
Sauget Area 2: Site Q

PCBs

| PARAMETER | SAMPLE ID NUMBERS | | |
|---|---|---|---|
| | QD1 | QD2 | QD3 |
| PCBs | (mg/kg or PPM) | | |
| PCB 1260 | 180,000 | 260,000 | 230,000 |

TOTAL AND TCLP SEMIVOLATILES

| PARAMETER | SAMPLE ID NUMBERS | | |
|---|---|---|---|
| | QD1 | QD2 | QD3 |
| TOTALS SEMIVOCS | PARTS PER BILLION (ug/kg or PPB) | | |
| phenol | 69,000JD | U | U |
| 2-chlorophenol | 67,000JD | U | U |
| 1,4-dichlorobenzene | 110,00JD | U | U |
| n-nitroso-di-n-propylamine | 42,000JD | U | U |
| 1,2,4-trichlorobenzene | 51,000JD | U | U |
| 4-chloro-3-methylphenol | 67,000JD | U | U |
| acenaphthene | 44,000JD | U | U |
| 4-nitrophenol | 24,000JD | U | U |
| 2,4-dinitrotoluene | 40,000JD | U | U |
| pentachlorophenol | 20,000JD | U | U |
| TCLP SEMIVOCs | PARTS PER BILLION (ug/kg or PPB) | | |
| 2,4,6-trichlorophenol | U | 6.3J | U |
| pentachlorophenol | U | 16J | U |

key: U = undetected J = estimated value
D = analysis at secondary dilution factor

All samples analyzed at: Twin City Testing Corporation (Huntingdon)
St. Paul, Minnesota

TABLE 2
SELECTED SAMPLING RESULTS
FROM MAY 27, 1994
Sauget Area 2: Site Q

TCLP RCRA METALS

| PARAMETER | SAMPLE ID NUMBERS | | |
|---|---|---|---|
| | QD1 | QD2 | QD3 |
| TCLP METALS | PARTS PER BILLION (ug/kg or PPB) | | |
| arsenic | U | U | U |
| barium | 320 | 440 | 390 |
| cadmium | U | U | U |
| chromium | U | U | U |
| lead | U | U | U |
| mercury | U | U | U |
| selenium | U | U | U |
| silver | U | U | U |

key: U = undetected
All samples analyzed at: Twin City Testing Corporation (Huntingdon)
St. Paul, Minnesota

and can pass along contaminants via the food chain to larger animal species, and potentially to humans.

Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.

The TAT observed approximately 12 unearthed drums during its site visit. All drums had corroded or deteriorated, and were open to the environment. Evidence of drum spillage was noted around the drum area near the western edge of the landfill, with potentially many more drums under the surface that could pose a threat of release if immediate action is not taken. High levels of PCBs (up to 26%) were documented in samples collected from the drums. Unauthorized users of the property could accidentally or intentionally dump or move these containers, causing the potential for release of hazardous substances.

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.

Drum samples collected by TAT contained high levels of PCBs. During storm events or periods of high winds, exposed drum contents, and associated potentially contaminated soil, can migrate via drainage paths off-site to navigatible waterways, including the nearby Mississippi River. PCBs and dioxins have a high affinity for soils and can be carried via airborne dusts off-site to nearby residential and industrial areas.

Weather conditions that may cause pollutants or contaminants to migrate or be released.

All contaminants on-site are found outdoors under constant exposure to the weather. Exposure to the elements can cause excessive degradation of the on-site waste containers, which could cause further migration of contaminants if hazardous substances leaked.

## 5.1 CHEMICAL HAZARDS OF CONTAMINANTS DOCUMENTED AT THE SITE

Polychlorinated biphenyls (PCBs) are suspected carcinogens in humans and known animal mutagens. These compounds cause damage to skin, liver, eyes, and the respiratory system. Acute symptoms include skin, eye, nose, and throat irritation, vomiting, edema, abdominal pain, fatigue, and pigmentation of skin and nails. Chronic effects cause chloracne, liver damage, heart/kidney edema, possible embryotoxin in unborn, and gray-brown skin. The Occupational Safety and Health Administration (OSHA) Permissible exposure limit (PEL) is 0.09 ppm (skin) and 1 ppm (inhalation) for PCB Arochlor 1242 and 0.03 ppm (skin) and 0.5 ppm (inhalation) for PCB Arochlor 1254. No data was available for PCB Arochlor 1260.

Dioxin is acutely toxic and a suspected human carcinogen. In acute exposures, dioxin causes liver toxicity, symptoms of diarrhea, headache, chloracne, weight loss, psychological disturbances, and inflammation of the kidney and bladder. Chronic exposure suppresses the immune system and causes cancer in lab animals. Dioxin is a solid under normal conditions.

## 6.0 SUMMARY

The presence of the threats addressed above will require the handling of an unknown number of exposed and buried drums and any associated contaminated surficial and subsurface soils.

At this time, it is proposed that the site will be stabilized by the following process:

1) Remove/consolidate all surface vegetation and debris;

2) Stockpile and sample all soils surrounding the exposed, buried drums;

3) Remove all affected drums and sample all drum contents;

4) Dispose of all contaminated drums, soils, and non-hazardous materials;

5) Backfill and cover excavated area with appropriate material, level to grade; and

6) Implement appropriate erosion control measure on exposed/excavated areas.

The removal action is assumed to be completed in 10 10-hour work days with one phase of work. Planned work will include the removal and clearing of all non-hazardous materials, backfilling the excavated areas, and bringing the site to grade for riprap stone placement prior to site demobilization.

## 7.0 EVALUATION OF CLEANUP COSTS

A cost estimate for the removal of solid wastes at the Sauget Area 2: Site Q site has been based on several assumptions. It is inappropriate to estimate waste volumes at the site, due to lack of information regarding the composition and areal extent of contamination. However, for the cost estimate, it was estimated that 50 affected drums and 20 cubic yards of contaminated soil along the edge of the landfill would need to be removed and disposed of. No landfill improvements are proposed outside of using riprap stone for erosion control.

Off-site disposal methods for the waste streams from this site are considered practical and appropriate given the immediate time

frame needed for the removal and the waste types involved (organics and PCBs). Prior to final disposal, all waste streams will be representatively sampled and analyzed for waste disposal parameters. Based on the high PCB levels, all associated drum material will be placed into hazardous waste roll-off boxes and shipped off-site for incineration. The contaminated soils waste stream will be disposed of in an appropriate RCRA-permitted landfill depending on contaminant concentration. All crushed, empty drums, used personal protective equipment (PPE), and debris will be disposed of as non-hazardous special waste in a nearby, appropriately-permitted municipal landfill.

Additional assumptions include:

- Riedel Environmental was assumed to be the contractor for this removal action.

- Any nonhazardous material (debris, soil, crushed containers, scrap, etc.) located on the landfill will be used as fill material in the excavation depression.

- Service Contract wages were used for the labor categories.

- No demurrage costs associated with the transportation of the fill material is assumed.

- An approximate cost of $11/cubic yard for the riprap stone was used, including delivery charges.

Refer to the cost projection in Attachment C.

## 8.0 COST PROJECTION SUMMARY

| | |
|---|---|
| CONTRACTOR PERSONNEL | $ 27,977.96 |
| CONTRACTOR EQUIPMENT | 9,296.36 |
| UNIT RATE MATERIALS | 5,329.50 |
| AT COST MATERIALS | 1,123.38 |
| SUBCONTRACTORS | 21,318.00 |
| WASTE TRANSPORTATION | 16,761.80 |
| WASTE DISPOSAL | $ 55,280.50 |
| CLEANUP CONTRACTOR SUBTOTAL | $137,087.50 |
| EXTRAMURAL SUBTOTAL | $137,087.50 |
| 20% EXTRAMURAL CONTINGENCY | $ 27,417.50 |
| EXTRAMURAL SUBTOTAL | $164,505.00 |
| TAT PERSONNEL | $ 8,407.20 |
| TOTAL TAT COSTS | $ 8,407.20 |
| EXTRAMURAL SUBTOTAL | $172,912.20 |
| 15% PROJECT CONTINGENCY | $ 25,936.83 |
| TOTAL EXTRAMURAL COST | $198,849.03 |
| EPA REGIONAL PERSONNEL | $ 6,840.00 |
| EPA HEADQUARTERS DIRECT (10% OF REGIONAL HOURS) | $ 540.00 |
| EPA INDIRECT | $ 9,540.00 |
| EPA TOTAL | $16,920.00 |
| PROJECT TOTAL | $ 215,769.03 |

# ATTACHMENT A - SITE PHOTOGRAPHS

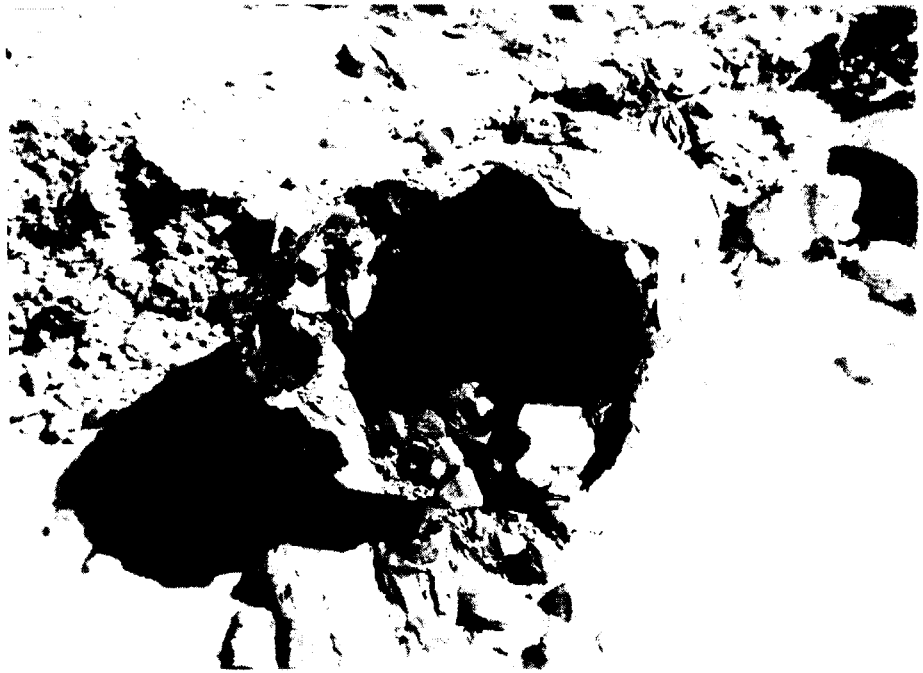
SITE NAME: SAUGET AREA 2
TDD: T05-9405-007

DATE: 5/27/94
TIME: 1610 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: S

SUBJECT: WESTERN EDGE OF SITE Q LANDFILL ALONG BEACHFRONT TO MISSISSIPPI RIVER. NOTE ALL THE DEBRIS ASSOCIATED ALONG THE BEACH ALONG WITH THE DRUMS.



SITE NAME: SAUGET AREA 2
TDD: T05-9405-007

DATE: 5/27/94
TIME: 1615 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: DOWN

SUBJECT: CLOSEUP VIEW OF CORRODED DE[illegible] CONTAINING A DARK BROWN SO[illegible] SAMPLE QD1 WAS COLLECTED FRO[illegible] DRUM AND CONTAINED HIGH [illegible] PCBS.

TE NAME: SAUGET AREA 2
D: T05-9405-007

TE: 5/27/94
ME: 1600 HOURS

OTOGRAPHER: SAM BORRIES

RECTION: NW

JECT: VIEW OF TOP OF SITE Q LANDFILL LOOKING DOWN TOWARD THE EDGE OF THE MISSISSIPPI RIVER. NOTE THE CORRODED DRUMS AND DEBRIS IN FOREGROUND OF PHOTO. THIS AREA WAS EXPOSED LAST YEAR DURING FLOODING ALONG THE RIVER.

SITE NAME: SAUGET AREA 2
TDD: T05-9405-007

DATE: 5/27/94
TIME: 1605 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: S

SUBJECT: VIEW OF UNEARTHED DRUMS NEAR [illegible] OF SITE LANDFILL. NOTE THE CORRODED DRUMS PROTRUDING OUT [illegible] LEDGE CAUSED BY WASHOUT FLOODING OF THE MISSISSIPPI RIVER.

SITE NAME: **SAUGET AREA 2**
TDD: **T05-9405-007**

DATE: **5/27/94**
TIME: **1620 HOURS**

PHOTOGRAPHER: **SAM BORRIES**

DIRECTION: **E**

SUBJECT: **CLOSEUP VIEW OF TWO DRUMS WITH BROWN SOLID CONTAINING HIGH PCBS. SAMPLE QD3 WAS COLLECTED FROM DRUM ON LEFTHAND SIDE OF PHOTO.**

SITE NAME: SAUGET AREA 2
TDD: T05-9405-007

DATE: 5/27/94
TIME: 1625 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: NE

SUBJECT: ANOTHER VIEW OF LANDF[illegible]
EDGE SHOWING WASHOUT [illegible]
THE COLOR DIFFERENCE [illegible]
THE LANDFILL (DARK [illegible]
NATIVE SOILS (LIGHT [illegible]

ITE NAME: SAUGET AREA 2
DD: T05-9405-007

TE: 5/27/94
IME: 1630 HOURS

HOTOGRAPHER: SAM BORRIES

IRECTION: NE

UBJECT: ANOTHER VIEW OF EXPOSED LANDFILL WITH APPROXIMATELY 20 DRUMS IN VIEW. NOTE ALL THE CONSTRUCTION DEBRIS AND PLASTIC SHEETING IN FOREGROUND.

SITE NAME: SAUGET AREA 2
TDD: T05-9405-007

DATE: 5/27/94
TIME: 1635 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: N

SUBJECT: VIEW OF EDGE OF LANDFILL AND NEARBY BEACHFRONT. NOTE THE [illegible] OF FERTILIZER FROM NEARBY FERTILIZER PLANT IN BACKGROUND.

SITE NAME: **SAUGET AREA 2**
TDD: **T05-9405-007**

DATE: **5/27/94**
TIME: **1650 HOURS**

PHOTOGRAPHER: **SAM BORRIES**

DIRECTION: **NW**

SUBJECT: **ANOTHER VIEW OF WESTERN EDGE OF SITE Q WITH RIVER AND CITY OF ST. LOUIS IN BACKGROUND.**

ITE NAME: SAUGET AREA 2
DD: T05-9405-007

ATE: 5/27/94
IME: 1640 HOURS

HOTOGRAPHER: SAM BORRIES

IRECTION: E

JBJECT: BEACHFRONT WITH DRIFTWOOD AND EXPOSED DRUMS/LANDFILL IN THE BACKGROUND. NOTE THE 12-FOOT DROP-OFF FROM THE TOP OF THE LANDFILL DOWN TO THE WATER'S EDGE.

SITE NAME: SAUGET AREA 2
TDD: T05-9405-007

DATE: 5/27/94
TIME: 1645 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: NW

SUBJECT: SITE Q LANDFILL ALONG THE MISSISSIPPI RIVER WITH THE CITY OF ST. LOUIS, MISSOURI IN THE DISTANCE.

# ATTACHMENT B - ANALYTICAL DATA PACKAGE

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663 9415
International Specialists in the Environment

# M E M O R A N D U M

**DATE:** July 29, 1994

**TO:** Steven Skare, Project Manager, E & E, Chicago, IL

**FROM:** David Hendren, TAT-Chemist, E & E, Chicago, IL

**SUBJ:** **Semi-Volatile and TCLP Semivolatile Data Quality Assurance Review** for Sauget Area Two, Sauget, St. Clair County, Illinois

**REF:** Analytical TDD:T05-9405-804 Project TDD:T05-9405-007
Analytical PAN:EIL0837AAA Project PAN:EIL0837SAA

This memo has been prepared to discuss analytical results showing the detection of pentachlorophenol in a sample (QD2) undergoing analysis for TCLP semi-volatiles (SVOA), and non-detection of pentachlorophenol in the total semi-volatile analysis of the same sample. Although these results appear to contradict each other, the following discussion explains how this can occur.

Although mostly insoluble in water, pentachlorophenol would be readily leached through TCLP extraction, in concentrations that are detectable (i.e. low part per billion). Extraction for total SVOA uses an organic solvent (usually methylene chloride) and may require dilution of the sample extract before analysis, due to the presence of organic soluble material. Such a dilution will elevate the detection limits for all analytes. Therefore, pentachlorophenol may be present in the sample at low concentrations but reported as "not-detected" because of elevated detection limits. Detection limits should always be considered whenever a result of "not-detected" is provided.

This memo should not be considered as an endorsement of the laboratory's results but rather an explanation of what occurred.

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 26, 1994

TO: Steve Skare, Project Manager, E & E, Chicago, IL

FROM: Yvette Anderson, TAT-Chemist, E & E, Chicago, IL

THRU: Nabil Fayoumi, TAT-Chemist, E & E, Chicago, IL NF

SUBJ: **Inorganic Data Quality Assurance Review**, Sauget Area Two, East St. Louis, St. Clair County, Illinois.

REF: Analytical TDD: T059405804 Project TDD: T059405007
Analytical PAN: EIL0837AAA Project PAN: EIL0837SAA

The data quality assurance review of 3 soil samples collected from the Sauget Area Two site in East St. Louis, Illinois has been completed. Analysis for **TCLP RCRA Metals** was performed by Twin City Testing Corporation of St. Paul, Minnesota in accordance with U.S. EPA Methods 200.7 and 7470.

The soil samples were numbered QD-1 through QD-3 in the field. The laboratory labelled the samples 25160 through 25162.

Data Qualifications:

**I Sample Holding Time: Acceptable**

The samples were collected on 5/27/94, extracted on 6/2/94, and analyzed on 6/14/94 through 6/16/94. The holding time criteria of 6 months for metals and 28 days for mercury from collection to analysis was satisfied.

**II Calibration: Acceptable.**

**A. Initial Calibration:**

Calibration results were within the established quality control limits of 90-110% of the true value for metals. A linearity check was satisfied for mercury.

**B. Continuing Calibration:**

Calibration results were within the established quality control limits of 90-110% of the true value for metals and 80-120% for mercury.

**III Method Blank: Acceptable.**

A method blank was analyzed with the samples. No contaminants above the instrument detection limit (IDL) were detected.

**IV Interference Check Sample Analysis: Acceptable.**

All parameters were within the Interference Check Sample (ICS) control limits of 80-120% of the true values. ICS was run at the beginning and end of sample analysis.

**V Matrix Spike/Matrix Spike Duplicate: Acceptable.**

The percent recoveries and relative percent differences were within the established quality control limits of 80-120%.

**VI Laboratory Control Sample analysis: Acceptable.**

The quality control criteria of 80-120% were met for the control sample.

**VII Overall Assessment of Data for Use**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-04 April, 1990). Based upon the information provided, the data are acceptable for use.

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 26, 1994

TO: Steve Skare, Project Manager, E & E, Chicago, IL

FROM: Yvette Anderson, TAT-Chemist, E & E, Chicago, IL

THRU: Nabil Fayoumi, TAT-Chemist, E & E, Chicago, IL NF

SUBJ: **Polychlorinated Biphenyl Data Quality Assurance Review,** Sauget Area Two, East St. Louis, St. Clair County, Illinois.

REF: Analytical TDD: T059405804 Project TDD: T059405007
Analytical PAN: EIL0837AAA Project PAN:EIL0837SAA

The data quality assurance review of 3 soil samples collected from the Sauget Area Two site in East St. Louis, Illinois has been completed. Analysis for **Polychlorinated Biphenyls (PCBs)** was performed by Twin City Testing Corporation of St. Paul, Minnesota in accordance with U.S. EPA Method 8080.

The soil samples were numbered QD-1 through QD-3 in the field. The laboratory labelled the samples 25160 though 25162.

Data Qualifications:

**I Sample Holding Time: Acceptable.**

The samples were collected on 5/27/94, extracted on 6/9/94, and analyzed on 6/14/94. The holding time criteria of 14 days from collection to extraction was satisfied. The analysis of the samples was completed within the 40 day holding time requirement after extraction.

**II Instrument Performance: Acceptable.**

The standards were within the estimated retention time windows. The retention time for DDT was greater than 12 minutes. Peak resolution was adequate, and retention time was greater than

25%. The retention time shift for the surrogate was less than 0.3% for the capillary column.

**III Calibration: Acceptable.**

A 3-point calibration check was performed prior to sample analysis. The linearity check was within criterion.

**IV Method Blank: Acceptable.**

A method blank was analyzed with the samples. No contaminants above the instrument detection limit (IDL) were detected.

**V Matrix Spike/Matrix Spike Duplicate: No Action Required.**

According to the lab the percent recoveries and relative percent differences could not be calculated due to the large sample dilution factor. Dilution was essential to allow passage of the samples through the GPC for clean-up.

**VI Overall Assessment of Data for Use**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-04 April, 1990). Based upon the information provided, the data are acceptable for use.

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 26, 1994

TO: Steve Skare, Project Manager, E & E, Chicago, IL

FROM: Yvette Anderson, TAT-Chemist, E & E, Chicago, IL

THRU: Nabil Fayoumi, TAT-Chemist, E & E, Chicago, IL NF

SUBJ: **Organic Data Quality Assurance Review**, Sauget Area Two, East St. Louis, St. Clair County, Illinois.

REF: Analytical TDD: T059405804 Project TDD: T059405007
Analytical PAN: EIL0837AAA Project PAN: EIL0837SAA

The data quality assurance review of 3 soil samples collected from the Sauget Area Two site in East St. Louis, Illinois has been completed. Analysis for **Semivolatile Organics (SVOAs)** was performed by Twin City Testing Corporation St. Paul, Minnesota, in accordance with U.S. EPA Method 8270.

The soil samples were numbered QD-1 through QD-3 in the field. The laboratory labelled the samples 25160 through 25162.

Data Qualifications:

**I Sample Holding Time: Acceptable.**

The samples were collected on 5/27/94, extracted on 6/12/94, and analyzed on 6/13/94. The holding time criteria of 14 days from collection to extraction and 40 days from extraction to analysis was met.

**II GC/MS Tuning: Acceptable.**

GC/MS ion abundance criteria using Decafluorotriphenylphosphine (DFTPP) for SVOA were acceptable.

**III Calibration: Acceptable.**

**A. Initial Calibration:**

A 5-point initial calibration was performed prior to analysis. All average relative response factors were greater than 0.05 for SVOA. The percent relative standard deviation (%RSD) between response factors were less than 30%.

**B. Continuing Calibration:**

The percent difference (%D) between initial and continuing calibration for SVOA were within the quality control criteria of less than or equal to 25%.

**IV Method Blank: Acceptable.**

A method blank was analyzed with the samples. No contaminants above the estimated quantitation limit (EQL) were detected.

**V Internal Standard: No Action Required.**

The established quality control criteria for the internal standard (IS) area counts was in the range of -50 to +100% from the associated calibration standard, except chrysene-d12 and perylene-d12. The compounds were not within criteria due to matrix interference or suppression, according to the laboratory. Retention time for IS is within the ± 30 second control limit.

**VI Matrix Spike/Matrix Spike Duplicate: No Action Required.**

The percent recoveries and relative percent differences were within the established quality control limits, except pyrene. No action is required.

**VII Overall Assessment of Data for Use**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-04 April, 1990). Based upon the information provided, the data are acceptable for use.

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 26, 1994

TO: Steve Skare, Project Manager, E & E, Chicago, IL

FROM: Yvette Anderson, TAT-Chemist, E & E, Chicago, IL

THRU: Nabil Fayoumi, TAT-Chemist, E & E, Chicago, IL *NF*

SUBJ: **Organic Data Quality Assurance Review**, Sauget Area Two, East St. Louis, St. Clair County, Illinois.

REF: Analytical TDD: T059405804 Project TDD: T059405007
Analytical PAN: EIL0837AAA Project PAN: EIL0837SAA

The data quality assurance review of 3 soil samples collected from the Sauget Area Two site in East St. Louis, Illinois has been completed. Analysis for **TCLP Semivolatiles (SVOAs)** was performed by Twin City Testing corporation, in accordance with U.S. EPA Methods 3510 and 8270.

The soil samples were numbered QD-1 through QD-3 in the field. The laboratory labelled the samples 25160 through 25162.

Data Qualifications:

**I Sample Holding Time: Acceptable.**

The samples were collected on 5/27/94, extracted on 6/5/94, and analyzed on 6/6/94. The holding time criteria of 14 days from collection to extraction and 40 days from extraction to analysis was met.

**II GC/MS Tuning: Acceptable.**

GC/MS ion abundance criteria using Decafluorotriphenylphosphine (DFTPP) for SVOA were acceptable.

**III Calibration: Acceptable.**

**A. Initial Calibration:**

A 5-point initial calibration was performed prior to analysis. All average relative response factors were greater than 0.05 for SVOA. The percent relative standard deviation (%RSD) between response factors were less than 30%.

**B. Continuing Calibration:**

The percent difference (%D) between initial and continuing calibration for SVOA were within the quality control criteria of less than or equal to 25%.

**IV Method Blank: Acceptable.**

A method blank was analyzed with the samples. No contaminants above the estimated quantitation limit (EQL) were detected.

**V Internal Standard: Acceptable.**

The established quality control criteria for the internal standard (IS) area counts was in the range of -50 to +100% from the associated calibration standard. Retention time for IS is within the $\pm$ 30 second control limit.

**VI Matrix Spike/Matrix Spike Duplicate: No Action Required.**

The percent recoveries and relative percent differences were within the established quality control limits, except pentachlorophenol. No action is required.

**VII Overall Assessment of Data for Use**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-04 April, 1990). Based upon the information provided, the data are acceptable for use.

# Huntingdon

## TCLP METAL RESULTS

(All values are in µg/L which is equivalent to parts-per-billion)

| Client ID: | QD1 | QD2 | QD3 | | | |
|---|---|---|---|---|---|---|
| TCT ID: | 25160 | 25161 | 25162 | | | |
| **Parameter** | | | | **PQL** | **Test Date** | **Test Method** |
| Arsenic | ND | ND | ND | 100 | 6/14/94 | 200.7 |
| Barium | 320 | 440 | 390 | 10 | 6/14/94 | 200.7 |
| Cadmium | ND | ND | ND | 10 | 6/14/94 | 200.7 |
| Chromium | ND | ND | ND | 10 | 6/14/94 | 200.7 |
| Lead | ND | ND | ND | 50 | 6/14/94 | 200.7 |
| Mercury | ND | ND | ND | 0.40 | 6/16/94 | 7470 |
| Selenium | ND | ND | ND | 100 | 6/14/94 | 200.7 |
| Silver | ND | ND | ND | 10 | 6/15/94 | 200.7 |

ND = Not Detected

PQL = Practical Quantitation Limit

**Reference**: Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983.

EPA Test Methods for Evaluating Solid Wastes, SW-846, November 1986, 3rd Edition..

Federal Register, Volume 55, Number 126, June 1990, 40CFR, Method 1311.

**LABORATORY NO:** 4416-94-5039

# Huntingdon

## POLYCHLORINATED BIPHENYL RESULTS
## EPA METHOD 8080

(All values are in μg/Kg which is equal to parts-per-billion)

| | | |
|---|---|---|
| **Client ID:** | **QD1** | |
| TCT ID: | 25160 | |
| **Parameter:** | | **PQL** |
| PCB 1016 | ND | 11,000,000 |
| PCB 1221 | ND | 11,000,000 |
| PCB 1232 | ND | 11,000,000 |
| PCB 1242 | ND | 11,000,000 |
| PCB 1248 | ND | 11,000,000 |
| PCB 1254 | ND | 11,000,000 |
| PCB 1260 | 180,000,000[2] | 11,000,000 |
| % Surrogate #1 Recovery: | ---%[1] | |
| % Surrogate #2 Recovery: | ---%[1] | |
| **Date Extracted:** | 6/9/94 | |
| **Date Analyzed:** | 6/14/94 | |

[1]Low surrogate (diluted out)
[2]Reported value not confirmed within 25% RPD

All results are reported on a dry weight basis.

PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)

**Reference**: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

**LABORATORY NO:** 4416-94-5039

Huntingdon

# POLYCHLORINATED BIPHENYL RESULTS
# EPA METHOD 8080

(All values are in μg/Kg which is equal to parts-per-billion)

| | | |
|---|---|---|
| **Client ID:** | **QD2** | |
| TCT ID: | 25161 | |
| **Parameter:** | | **PQL** |
| PCB 1016 | ND | 21,000,000 |
| PCB 1221 | ND | 21,000,000 |
| PCB 1232 | ND | 21,000,000 |
| PCB 1242 | ND | 21,000,000 |
| PCB 1248 | ND | 21,000,000 |
| PCB 1254 | ND | 21,000,000 |
| PCB 1260 | 260,000,000 | 21,000,000 |
| % Surrogate #1 Recovery: | ---%[1] | |
| % Surrogate #2 Recovery: | ---%[1] | |
| **Date Extracted:** | 6/9/94 | |
| **Date Analyzed:** | 6/14/94 | |

[1]Low surrogate (diluted out)

All results are reported on a dry weight basis.

PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)

**Reference:** EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

**LABORATORY NO:** 4416-94-5039

# Huntingdon

## POLYCHLORINATED BIPHENYL RESULTS
## EPA METHOD 8080

(All values are in μg/Kg which is equal to parts-per-billion)

| | | |
|---|---|---|
| **Client ID:** | **QD3** | |
| TCT ID: | 25162 | |
| **Parameter:** | | **PQL** |
| PCB 1016 | ND | 23,000,000 |
| PCB 1221 | ND | 23,000,000 |
| PCB 1232 | ND | 23,000,000 |
| PCB 1242 | ND | 23,000,000 |
| PCB 1248 | ND | 23,000,000 |
| PCB 1254 | ND | 23,000,000 |
| PCB 1260 | 230,000,000[2] | 23,000,000 |
| % Surrogate #1 Recovery: | ---%[1] | |
| % Surrogate #2 Recovery: | ---%[1] | |
| **Date Extracted:** | 6/9/94 | |
| **Date Analyzed:** | 6/14/94 | |

[1]Low surrogate (diluted out)
[2]Reported value not confirmed

All results are reported on a dry weight basis.

PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)

**Reference**: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

**LABORATORY NO:** 4416-94-5039

Huntingdon

# ORGANOCHLORINE PESTICIDE/PCB RESULTS
# EPA METHOD 8080

(All values are in µg/kg which is equal to parts-per-billion)

| **Client ID:** | **CCAL Ch. 25** | **CCAL Ch. 26** | |
|---|---|---|---|
| TCT ID: | | | |
| **Compounds:** | | | **PQL** |
| Aldrin | 94% | 97% | 0.83 |
| alpha-BHC | 103% | 113% | 0.83 |
| beta-BHC | 90% | 105% | 0.83 |
| delta-BHC | 92% | 102% | 0.83 |
| gamma-BHC (Lindane) | 105% | 107% | 0.83 |
| 4,4'-DDD | 100% | 126% | 1.7 |
| 4,4'-DDE | 92% | 112% | 1.7 |
| 4,4'-DDT | 109% | 119% | 1.7 |
| Dieldrin | 106% | 110% | 1.7 |
| alpha-Endosulfan | 95% | 110% | 0.83 |
| beta-Endosulfan | 100% | 105% | 1.7 |
| Endosulfan Sulfate | 106% | 97% | 1.7 |
| Endrin | 126% | 122% | 1.7 |
| Endrin Aldehyde | 90% | 101% | 1.7 |
| Heptachlor | 102% | 105% | 0.83 |
| Heptachlor Epoxide | 94% | 96% | 0.83 |
| 4,4'-Methoxychlor | 101% | 101% | 8.3 |
| gamma-Chlordane | 96% | 105% | 17 |
| alpha-Chlordane | 90% | 102% | 17 |
| PCB 1260 | 62% | 70% | 17 |
| % Surrogate #1 Recovery: | 112% | 112% | |
| % Surrogate #2 Recovery: | 84% | 105% | |
| **Date Extracted:** | | | |
| **Date Analyzed:** | 6/13/94 | 6/13/94 | |

PQL = Practical Quantitation Limit
ND = Not Detected

Surrogate #1 = TCMX (2,4,5,6-tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)

**Reference:** EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

**LABORATORY NO:** 4416-94-5039

EPA METHOD 8270
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

**Huntingdon**

| | | | |
|---|---|---|---|
| Client ID: | QD1 | Lab ID (HSN): | QD1 |
| Matrix: | LEACH | Filename: | 4157K16 |
| Date Sampled: | 05/27/94 | Sample Size: | 200 mL |
| Date Received: | 05/31/94 | Extract Vol.: | 1000 uL |
| Date Extracted: | 06/05/94 | Dil. Factor: | 1 |
| Date Analyzed: | 06/06/94 | | |
| Date Leached: | 06/02/94 | | |

| Compounds: | ug/L (PPB) | EQL |
|---|---|---|
| Pyridine | 50 U | 50 |
| 1,4-Dichlorobenzene | 50 U | 50 |
| o-Cresol | 50 U | 50 |
| m- and/or p-Cresol | 50 U | 50 |
| Hexachloroethane | 50 U | 50 |
| Nitrobenzene | 50 U | 50 |
| Hexachloro-1,3-butadiene | 50 U | 50 |
| 2,4,6-Trichlorophenol | 50 U | 50 |
| 2,4,5-Trichlorophenol | 130 U | 130 |
| 2,4-Dinitrotoluene | 50 U | 50 |
| Hexachlorobenzene | 50 U | 50 |
| Pentachlorophenol | 130 U | 130 |

| Surrogate Recovery | | QC LIMITS |
|---|---|---|
| 2-Fluorophenol | 45% | 21-110% |
| Phenol-d5 | 30% | 10-110% |
| 2-Chlorophenol-d4 | 72% | 33-110% |
| Nitrobenzene-d5 | 86% | 35-114% |
| 2-Fluorobiphenyl | 74% | 43-116% |
| 2,4,6-Tribromophenol | 88% | 10-123% |
| Terphenyl-d14 | 101% | 33-141% |

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

EPA METHOD 8270
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

| | | | |
|---|---|---|---|
| Client ID: | QD2 | Lab ID (HSN): | QD2 |
| Matrix: | LEACH | Filename: | 4157K17 |
| Date Sampled: | 05/27/94 | Sample Size: | 200 mL |
| Date Received: | 05/31/94 | Extract Vol.: | 1000 uL |
| Date Extracted: | 06/05/94 | Dil. Factor: | 1 |
| Date Analyzed: | 06/06/94 | | |
| Date Leached: | 06/02/94 | | |

| Compounds: | ug/L (PPB) | EQL |
|---|---|---|
| Pyridine | 50 U | 50 |
| 1,4-Dichlorobenzene | 50 U | 50 |
| o-Cresol | 50 U | 50 |
| m- and/or p-Cresol | 50 U | 50 |
| Hexachloroethane | 50 U | 50 |
| Nitrobenzene | 50 U | 50 |
| Hexachloro-1,3-butadiene | 50 U | 50 |
| 2,4,6-Trichlorophenol | 6.3 J | 50 |
| 2,4,5-Trichlorophenol | 130 U | 130 |
| 2,4-Dinitrotoluene | 50 U | 50 |
| Hexachlorobenzene | 50 U | 50 |
| Pentachlorophenol | 16 J | 130 |

| Surrogate Recovery | | QC LIMITS |
|---|---|---|
| 2-Fluorophenol | 52% | 21-110% |
| Phenol-d5 | 36% | 10-110% |
| 2-Chlorophenol-d4 | 79% | 33-110% |
| Nitrobenzene-d5 | 92% | 35-114% |
| 2-Fluorobiphenyl | 74% | 43-116% |
| 2,4,6-Tribromophenol | 103% | 10-123% |
| Terphenyl-d14 | 130% | 33-141% |

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

EPA METHOD 8270 **Huntingdon**
. TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

| | | | |
|---|---|---|---|
| Client ID: | QD3 | Lab ID (HSN): | QD3 |
| Matrix: | LEACH | Filename: | 4157K18 |
| Date Sampled: | 05/27/94 | Sample Size: | 200 mL |
| Date Received: | 05/31/94 | Extract Vol.: | 1000 uL |
| Date Extracted: | 06/05/94 | Dil. Factor: | 1 |
| Date Analyzed: | 06/06/94 | | |
| Date Leached: | 06/02/94 | | |

| Compounds: | ug/L (PPB) | EQL |
|---|---|---|
| Pyridine | 50 U | 50 |
| 1,4-Dichlorobenzene | 50 U | 50 |
| o-Cresol | 50 U | 50 |
| m- and/or p-Cresol | 50 U | 50 |
| Hexachloroethane | 50 U | 50 |
| Nitrobenzene | 50 U | 50 |
| Hexachloro-1,3-butadiene | 50 U | 50 |
| 2,4,6-Trichlorophenol | 50 U | 50 |
| 2,4,5-Trichlorophenol | 130 U | 130 |
| 2,4-Dinitrotoluene | 50 U | 50 |
| Hexachlorobenzene | 50 U | 50 |
| Pentachlorophenol | 130 U | 130 |

| Surrogate Recovery | | QC LIMITS |
|---|---|---|
| 2-Fluorophenol | 52% | 21-110% |
| Phenol-d5 | 36% | 10-110% |
| 2-Chlorophenol-d4 | 75% | 33-110% |
| Nitrobenzene-d5 | 90% | 35-114% |
| 2-Fluorobiphenyl | 71% | 43-116% |
| 2,4,6-Tribromophenol | 101% | 10-123% |
| Terphenyl-d14 | 138% | 33-141% |

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

**Huntingdon**

| | | | |
|---|---|---|---|
| Client ID: | QD1 | Lab ID (HSN): | 25160 |
| Matrix: | SOIL | Filename: | 4163P11 |
| Date Sampled: | 05/27/94 | Sample Size: | 1 grams |
| Date Received: | 05/31/94 | Extract Vol.: | 500 uL |
| Date Extracted: | 06/09/94 | Dil. Factor: | 10 |
| Date Analyzed: | 06/13/94 | GPC Factor: | 2 |
| | | % Moisture: | 6.4 |

| Compounds: | ug/Kg (PPB) | | EQL |
|---|---|---|---|
| Phenol | 110000 | UD Y | 110000 |
| bis(2-Chloroethyl)ether | 110000 | UD Y | 110000 |
| 2-Chlorophenol | 110000 | UD Y | 110000 |
| 1,3-Dichlorobenzene | 110000 | UD Y | 110000 |
| 1,4-Dichlorobenzene | 110000 | UD Y | 110000 |
| 1,2-Dichlorobenzene | 110000 | UD Y | 110000 |
| 2-Methylphenol | 110000 | UD Y | 110000 |
| 2,2'-oxybis(1-Chloropropane) | 110000 | UD Y | 110000 |
| 4-Methylphenol | 110000 | UD Y | 110000 |
| N-Nitroso-di-n-propylamine | 110000 | UD Y | 110000 |
| Hexachloroethane | 110000 | UD Y | 110000 |
| Nitrobenzene | 110000 | UD Y | 110000 |
| Isophorone | 110000 | UD Y | 110000 |
| 2-Nitrophenol | 110000 | UD Y | 110000 |
| 2,4-Dimethylphenol | 110000 | UD Y | 110000 |
| bis(2-Chloroethoxy)methane | 110000 | UD Y | 110000 |
| 2,4-Dichlorophenol | 110000 | UD Y | 110000 |
| 1,2,4-Trichlorobenzene | 110000 | UD Y | 110000 |
| Naphthalene | 110000 | UD Y | 110000 |
| 4-Chloroaniline | 110000 | UD Y | 110000 |
| Hexachlorobutadiene | 110000 | UD Y | 110000 |
| 4-Chloro-3-methylphenol | 110000 | UD Y | 110000 |
| 2-Methylnaphthalene | 110000 | UD Y | 110000 |
| Hexachlorocyclopentadiene | 110000 | UD | 110000 |
| 2,4,6-Trichlorophenol | 110000 | UD | 110000 |
| 2,4,5-Trichlorophenol | 270000 | UD | 270000 |
| 2-Chloronaphthalene | 110000 | UD | 110000 |
| 2-Nitroaniline | 270000 | UD | 270000 |
| Dimethylphthalate | 110000 | UD | 110000 |
| Acenaphthylene | 110000 | UD | 110000 |
| 2,6-Dinitrotoluene | 110000 | UD | 110000 |
| 3-Nitroaniline | 270000 | UD | 270000 |
| Acenaphthene | 110000 | UD | 110000 |
| 2,4-Dinitrophenol | 270000 | UD | 270000 |
| 4-Nitrophenol | 270000 | UD | 270000 |
| Dibenzofuran | 110000 | UD | 110000 |
| 2,4-Dinitrotoluene | 110000 | UD | 110000 |
| Diethylphthalate | 110000 | UD | 110000 |
| 4-Chlorophenyl-phenylether | 110000 | UD | 110000 |
| Fluorene | 110000 | UD | 110000 |
| 4-Nitroaniline | 270000 | UD | 270000 |
| 4,6-Dinitro-2-methylphenol | 270000 | UD | 270000 |

(continued)

EPA METHOD 8270 **Huntingdon**
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID: QD1 Lab ID (HSN): 25160
Matrix: SOIL Filename: 4163P11

| Compounds: | ug/Kg (PPB) | EQL |
|---|---|---|
| N-Nitrosodiphenylamine | 110000 UD | 110000 |
| 4-Bromophenyl-phenylether | 110000 UD | 110000 |
| Hexachlorobenzene | 110000 UD | 110000 |
| Pentachlorophenol | 270000 UD | 270000 |
| Phenanthrene | 110000 UD | 110000 |
| Anthracene | 110000 UD | 110000 |
| Carbazole | 110000 UD | 110000 |
| Di-n-butylphthalate | 110000 UD | 110000 |
| Fluoranthene | 110000 UD | 110000 |
| Pyrene | 110000 UD | 110000 |
| Butylbenzylphthalate | 110000 UD | 110000 |
| 3,3'-Dichlorobenzidine | 110000 UD | 110000 |
| Benz(a)anthracene | 110000 UD | 110000 |
| Chrysene | 110000 UD | 110000 |
| bis(2-Ethylhexyl)phthalate | 110000 UD | 110000 |
| Di-n-octylphthalate | 110000 UD | 110000 |
| Benzo(b)fluoranthene | 110000 UD | 110000 |
| Benzo(k)fluoranthene | 110000 UD | 110000 |
| Benzo(a)pyrene | 110000 UD | 110000 |
| Indeno(1,2,3-cd)pyrene | 110000 UD | 110000 |
| Dibenz(a,h)anthracene | 110000 UD | 110000 |
| Benzo(g,h,i)perylene | 110000 UD | 110000 |

| Surrogate Recovery | | QC LIMITS |
|---|---|---|
| 2-Fluorophenol | 43%JD | Y 25-121% |
| Phenol-d5 | 73%JD | Y 24-113% |
| 2-Chlorophenol-d4 | 61%JD | Y 20-130% |
| 1,2-Dichlorobenzene-d4 | 69%JD | Y 20-130% |
| Nitrobenzene-d5 | 85%JD | Y 23-120% |
| 2-Fluorobiphenyl | 107%JD | 30-115% |
| 2,4,6-Tribromophenol | 29%JD | 19-122% |
| Terphenyl-d14 | 96%JD | 18-137% |

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor
Y = Associated internal standard failed method criteria
Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5039

EPA METHOD 8270 **Huntingdon**
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

| | | | |
|---|---|---|---|
| Client ID: | QD2 | Lab ID (HSN): | 25161 |
| Matrix: | SOIL | Filename: | 4163P12 |
| Date Sampled: | 05/27/94 | Sample Size: | 1 grams |
| Date Received: | 05/31/94 | Extract Vol.: | 500 uL |
| Date Extracted: | 06/09/94 | Dil. Factor: | 10 |
| Date Analyzed: | 06/13/94 | GPC Factor: | 2 |
| | | % Moisture: | 4.2 |

| Compounds: | ug/Kg (PPB) | | EQL |
|---|---|---|---|
| Phenol | 100000 | UD | 100000 |
| bis(2-Chloroethyl)ether | 100000 | UD | 100000 |
| 2-Chlorophenol | 100000 | UD | 100000 |
| 1,3-Dichlorobenzene | 100000 | UD | 100000 |
| 1,4-Dichlorobenzene | 100000 | UD | 100000 |
| 1,2-Dichlorobenzene | 100000 | UD | 100000 |
| 2-Methylphenol | 100000 | UD | 100000 |
| 2,2'-oxybis(1-Chloropropane) | 100000 | UD | 100000 |
| 4-Methylphenol | 100000 | UD | 100000 |
| N-Nitroso-di-n-propylamine | 100000 | UD | 100000 |
| Hexachloroethane | 100000 | UD | 100000 |
| Nitrobenzene | 100000 | UD | 100000 |
| Isophorone | 100000 | UD | 100000 |
| 2-Nitrophenol | 100000 | UD | 100000 |
| 2,4-Dimethylphenol | 100000 | UD | 100000 |
| bis(2-Chloroethoxy)methane | 100000 | UD | 100000 |
| 2,4-Dichlorophenol | 100000 | UD | 100000 |
| 1,2,4-Trichlorobenzene | 100000 | UD | 100000 |
| Naphthalene | 100000 | UD | 100000 |
| 4-Chloroaniline | 100000 | UD | 100000 |
| Hexachlorobutadiene | 100000 | UD | 100000 |
| 4-Chloro-3-methylphenol | 100000 | UD | 100000 |
| 2-Methylnaphthalene | 100000 | UD | 100000 |
| Hexachlorocyclopentadiene | 100000 | UD | 100000 |
| 2,4,6-Trichlorophenol | 100000 | UD | 100000 |
| 2,4,5-Trichlorophenol | 260000 | UD | 260000 |
| 2-Chloronaphthalene | 100000 | UD | 100000 |
| 2-Nitroaniline | 260000 | UD | 260000 |
| Dimethylphthalate | 100000 | UD | 100000 |
| Acenaphthylene | 100000 | UD | 100000 |
| 2,6-Dinitrotoluene | 100000 | UD | 100000 |
| 3-Nitroaniline | 260000 | UD | 260000 |
| Acenaphthene | 100000 | UD | 100000 |
| 2,4-Dinitrophenol | 260000 | UD | 260000 |
| 4-Nitrophenol | 260000 | UD | 260000 |
| Dibenzofuran | 100000 | UD | 100000 |
| 2,4-Dinitrotoluene | 100000 | UD | 100000 |
| Diethylphthalate | 100000 | UD | 100000 |
| 4-Chlorophenyl-phenylether | 100000 | UD | 100000 |
| Fluorene | 100000 | UD | 100000 |
| 4-Nitroaniline | 260000 | UD | 260000 |
| 4,6-Dinitro-2-methylphenol | 260000 | UD | 260000 |

(continued)

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

**Huntingdon**

Client ID: QD2 Lab ID (HSN): 25161
Matrix: SOIL Filename: 4163P12

| Compounds: | ug/Kg (PPB) | | EQL |
|---|---|---|---|
| N-Nitrosodiphenylamine | 100000 UD | | 100000 |
| 4-Bromophenyl-phenylether | 100000 UD | | 100000 |
| Hexachlorobenzene | 100000 UD | | 100000 |
| Pentachlorophenol | 260000 UD | | 260000 |
| Phenanthrene | 100000 UD | | 100000 |
| Anthracene | 100000 UD | | 100000 |
| Carbazole | 100000 UD | | 100000 |
| Di-n-butylphthalate | 100000 UD | | 100000 |
| Fluoranthene | 100000 UD | | 100000 |
| Pyrene | 100000 UD | Y | 100000 |
| Butylbenzylphthalate | 100000 UD | Y | 100000 |
| 3,3'-Dichlorobenzidine | 100000 UD | Y | 100000 |
| Benz(a)anthracene | 100000 UD | Y | 100000 |
| Chrysene | 100000 UD | Y | 100000 |
| bis(2-Ethylhexyl)phthalate | 100000 UD | Y | 100000 |
| Di-n-octylphthalate | 100000 UD | Y | 100000 |
| Benzo(b)fluoranthene | 100000 UD | Y | 100000 |
| Benzo(k)fluoranthene | 100000 UD | Y | 100000 |
| Benzo(a)pyrene | 100000 UD | Y | 100000 |
| Indeno(1,2,3-cd)pyrene | 100000 UD | Y | 100000 |
| Dibenz(a,h)anthracene | 100000 UD | Y | 100000 |
| Benzo(g,h,i)perylene | 100000 UD | Y | 100000 |

| Surrogate Recovery | | | QC LIMITS |
|---|---|---|---|
| 2-Fluorophenol | 62%JD | | 25-121% |
| Phenol-d5 | 72%JD | | 24-113% |
| 2-Chlorophenol-d4 | 69%JD | | 20-130% |
| 1,2-Dichlorobenzene-d4 | 70%JD | | 20-130% |
| Nitrobenzene-d5 | 82%JD | | 23-120% |
| 2-Fluorobiphenyl | 106%JD | | 30-115% |
| 2,4,6-Tribromophenol | 69%JD | | 19-122% |
| Terphenyl-d14 | 178%JD | Y | 18-137% |

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor
Y = Associated internal standard failed method criteria
Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5039

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

**Huntingdon**

| | | | |
|---|---|---|---|
| Client ID: | QD3 | Lab ID (HSN): | 25162 |
| Matrix: | SOIL | Filename: | 4163P13 |
| Date Sampled: | 05/27/94 | Sample Size: | 1 grams |
| Date Received: | 05/31/94 | Extract Vol.: | 500 uL |
| Date Extracted: | 06/09/94 | Dil. Factor: | 10 |
| Date Analyzed: | 06/13/94 | GPC Factor: | 2 |
| | | % Moisture: | 10.7 |

| Compounds: | ug/Kg (PPB) | | EQL |
|---|---|---|---|
| Phenol | 110000 | UD | 110000 |
| bis(2-Chloroethyl)ether | 110000 | UD | 110000 |
| 2-Chlorophenol | 110000 | UD | 110000 |
| 1,3-Dichlorobenzene | 110000 | UD | 110000 |
| 1,4-Dichlorobenzene | 110000 | UD | 110000 |
| 1,2-Dichlorobenzene | 110000 | UD | 110000 |
| 2-Methylphenol | 110000 | UD | 110000 |
| 2,2'-oxybis(1-Chloropropane) | 110000 | UD | 110000 |
| 4-Methylphenol | 110000 | UD | 110000 |
| N-Nitroso-di-n-propylamine | 110000 | UD | 110000 |
| Hexachloroethane | 110000 | UD | 110000 |
| Nitrobenzene | 110000 | UD | 110000 |
| Isophorone | 110000 | UD | 110000 |
| 2-Nitrophenol | 110000 | UD | 110000 |
| 2,4-Dimethylphenol | 110000 | UD | 110000 |
| bis(2-Chloroethoxy)methane | 110000 | UD | 110000 |
| 2,4-Dichlorophenol | 110000 | UD | 110000 |
| 1,2,4-Trichlorobenzene | 110000 | UD | 110000 |
| Naphthalene | 110000 | UD | 110000 |
| 4-Chloroaniline | 110000 | UD | 110000 |
| Hexachlorobutadiene | 110000 | UD | 110000 |
| 4-Chloro-3-methylphenol | 110000 | UD | 110000 |
| 2-Methylnaphthalene | 110000 | UD | 110000 |
| Hexachlorocyclopentadiene | 110000 | UD | 110000 |
| 2,4,6-Trichlorophenol | 110000 | UD | 110000 |
| 2,4,5-Trichlorophenol | 280000 | UD | 280000 |
| 2-Chloronaphthalene | 110000 | UD | 110000 |
| 2-Nitroaniline | 280000 | UD | 280000 |
| Dimethylphthalate | 110000 | UD | 110000 |
| Acenaphthylene | 110000 | UD | 110000 |
| 2,6-Dinitrotoluene | 110000 | UD | 110000 |
| 3-Nitroaniline | 280000 | UD | 280000 |
| Acenaphthene | 110000 | UD | 110000 |
| 2,4-Dinitrophenol | 280000 | UD | 280000 |
| 4-Nitrophenol | 280000 | UD | 280000 |
| Dibenzofuran | 110000 | UD | 110000 |
| 2,4-Dinitrotoluene | 110000 | UD | 110000 |
| Diethylphthalate | 110000 | UD | 110000 |
| 4-Chlorophenyl-phenylether | 110000 | UD | 110000 |
| Fluorene | 110000 | UD | 110000 |
| 4-Nitroaniline | 280000 | UD | 280000 |
| 4,6-Dinitro-2-methylphenol | 280000 | UD | 280000 |

(continued)

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

**Huntingdon**

Client ID: QD3 Lab ID (HSN): 25162
Matrix: SOIL Filename: 4163P13

| Compounds: | ug/Kg (PPB) | | EQL |
|---|---|---|---|
| N-Nitrosodiphenylamine | 110000 UD | | 110000 |
| 4-Bromophenyl-phenylether | 110000 UD | | 110000 |
| Hexachlorobenzene | 110000 UD | | 110000 |
| Pentachlorophenol | 280000 UD | | 280000 |
| Phenanthrene | 110000 UD | | 110000 |
| Anthracene | 110000 UD | | 110000 |
| Carbazole | 110000 UD | | 110000 |
| Di-n-butylphthalate | 110000 UD | | 110000 |
| Fluoranthene | 110000 UD | | 110000 |
| Pyrene | 110000 UD | Y | 110000 |
| Butylbenzylphthalate | 110000 UD | Y | 110000 |
| 3,3'-Dichlorobenzidine | 110000 UD | Y | 110000 |
| Benz(a)anthracene | 110000 UD | Y | 110000 |
| Chrysene | 110000 UD | Y | 110000 |
| bis(2-Ethylhexyl)phthalate | 110000 UD | Y | 110000 |
| Di-n-octylphthalate | 110000 UD | Y | 110000 |
| Benzo(b)fluoranthene | 110000 UD | Y | 110000 |
| Benzo(k)fluoranthene | 110000 UD | Y | 110000 |
| Benzo(a)pyrene | 110000 UD | Y | 110000 |
| Indeno(1,2,3-cd)pyrene | 110000 UD | Y | 110000 |
| Dibenz(a,h)anthracene | 110000 UD | Y | 110000 |
| Benzo(g,h,i)perylene | 110000 UD | Y | 110000 |

| Surrogate Recovery | | | QC LIMITS |
|---|---|---|---|
| 2-Fluorophenol | 42%JD | | 25-121% |
| Phenol-d5 | 78%JD | | 24-113% |
| 2-Chlorophenol-d4 | 59%JD | | 20-130% |
| 1,2-Dichlorobenzene-d4 | 76%JD | | 20-130% |
| Nitrobenzene-d5 | 86%JD | | 23-120% |
| 2-Fluorobiphenyl | 110%JD | | 30-115% |
| 2,4,6-Tribromophenol | 17%JD | | 19-122% |
| Terphenyl-d14 | 169%JD | Y | 18-137% |

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor
Y = Associated internal standard failed method criteria
Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5039

ATTACHMENT C - COST PROJECTION

Summary Report

Initial Cost Projection Scenario: SAUGET AREA 2/SITE Q

Projection ID Number: IL0837SA
Cleanup Contractor: RES5 - Riedel Environmental

Date: 07/28/94
TAT Contractor: E & E, INC.

## Cost Projection Summary

| | |
|---|---|
| Contractor Personnel | 27,977.96 |
| Contractor Equipment | 9,296.36 |
| Unit Rate Materials | 5,329.50 |
| At Cost Materials | 1,123.38 |
| Subcontractors | 21,318.00 |
| Waste Transportation | 16,761.80 |
| Waste Disposal | 55,280.50 |
| Cleanup Contractor Subtotal | 137,087.50 |
| Federal and State Agencies | 0.00 |
| Extramural Subtotal | 137,087.50 |
| 20 % Extramural Contingency | 27,417.50 |
| Extramural Subtotal | 164,505.00 |
| TAT Personnel | 8,407.20 |
| TAT Special Projects | 0.00 |
| TAT Analytical Services | 0.00 |
| Total TAT Costs | 8,407.20 |
| Other Cost Items | 0.00 |
| Extramural Subtotal | 172,912.20 |
| 15 % Project Contingency | 25,936.83 |
| Total Extramural Cost | 198,849.03 |
| EPA Regional Personnel | 6,840.00 |
| EPA Non-Regional Personnel | 0.00 |
| EPA Headquarters Direct | 540.00 |
| (10 % of Regional Hours) | |
| EPA Indirect | 9,540.00 |
| EPA Total | 16,920.00 |
| Project Total | 215,769.03 |

Initial Cost Projection Scenario: SAUGET AREA 2/SITE Q

Projection ID Number: IL0837SA Date: 07/28/94

Cleanup Contractor: RES5 - Riedel Environmental TAT Contractor: E & E, INC.

## Project Scope

| Number | Step/Milestone | Estimated Duration | Cost |
|---|---|---|---|
| 000 | GENERAL SITE COSTS | 10 Days | 215,769.03 |
| | | | 215,769.03 |

# SAUGET AREA 2/SITE Q

# DETAILED COST REPORT BY CATEGORY

# JULY 28, 1994

# (5 PAGES)

# REDACTED

# NOT RELEAVANT TO THE SELECTION OF THE REMOVAL ACTION